WHAT IS CLAIMED IS:

1.   A control method for a motor, comprising the steps of:

(a)   determining a motor parameter;

(b)   providing a d-axis reference current and a q-axis reference current;

(c)   detecting actual currents of the motor and converting them into a d-axis actual current and a q-axis actual current;

(d)   calculating a d-axis counter electromotive force and a q-axis counter electromotive force at a sample period according to the motor parameter, the d-axis actual current and the q-axis actual current at the sample period, the d-axis actual current and the q-axis actual current at a last sample period, and a d-axis voltage and a q-axis voltage at the last sample period; and

(e)   calculating a d-axis voltage and a q-axis voltage at the sample period according to the motor parameter, the d-axis actual current and the q-axis actual current at the sample period, the d-axis reference current and the q-axis reference current at a next sample period, the d-axis counter electromotive force and the q-axis counter electromotive force at the sample period.

2.   The control method according to Claim 1, wherein in the step (d) the d-axis counter electromotive force and the q-axis counter electromotive force are equal to zero at a first ample period.

3.   The control method according to Claim 1, further comprising a step (f) for converting the d-axis voltage and the q-axis voltage into three phase voltages.

4.   The control method according to Claim 3, further comprising

a step (g) for calculating three phase control voltages according to the three phase voltages, a peak value of a comparing voltage and a DC voltage.

5.   The control method according to Claim 4, further comprising a step (h) for comparing the three phase control voltages and a comparing voltage of a PWM comparator to control a switch-mode inverter and to obtain three phase input voltage for controlling the motor.

6.   The control method according to Claim 5, further a repeat step for repeating the step (c) to the step (h) to calculate the three phase input voltages during all period for controlling the motor.

7.   The control method according to Claim 1, in the step (a) wherein the motor parameter is a leakage inductance.

8.   The control method according to Claim 7, wherein the leakage inductance is a constant.

9.   The control method according to Claim 7, wherein the leakage inductance is determined according to the d-axis voltage and the q-axis voltage at the last sample period and a last two sample period, the d-axis actual current and the q-axis actual current at the sample period, the last sample period and a last two sample period.

10.   A control system for a motor comprising:

an input means for receiving a motor parameter, a d-axis reference current and a q-axis reference current;

a detecting means for detecting actual currents of the motor and converting the three phase currents to a d-axis actual current and a q-axis actual current;

a first calculating means for calculating a d-axis counter electromotive force and a q-axis counter electromotive force at a sample period according to the motor parameter, the d-axis actual current and the

q-axis actual current at the sample period, the d-axis actual current and the q-axis actual current at a last sample period, and a d-axis voltage and a q-axis voltage at the last sample period; and

a second calculating means for calculating a d-axis voltage and a q-axis voltage at the sample period according to the motor parameter, the d-axis actual current and the q-axis actual current at the sample period, the d-axis reference current and the q-axis reference current at a next sample period, the d-axis counter electromotive force and the q-axis counter electromotive force at the sample period.

11.   The control system according to Claim 10, further comprising a converting means for converting the d-axis voltage and the q-axis voltage into three phase voltages.

12.   The control system according to Claim 11, further comprising a third calculating means for calculating three phase control voltages according to the three phase voltages, a peak value of a comparing voltage and a DC voltage.

13.   The control system according to Claim 12, further comprising a PWM comparator for comparing the three phase control voltages and a comparing voltage.

14.   The control system according to Claim 13, further comprising a switch-mode inverter for outputting three phase input voltage to the motor according to three phase switching signals from the PWM comparator.

15.   The control method according to Claim 10, wherein the motor parameter is a leakage inductance.

16.   The control system according to Claim 15, further comprising a fourth calculating means for calculating the leakage inductance according to the d-axis voltage and the q-axis voltage at the last sample period and a

last two sample period, the d-axis actual current and the q-axis actual current at the sample period, the last sample period and a last two sample period.